

REMARKS

The present application relates to hybrid maize plant and seed 33A72. Claims 1-32 are currently pending in the present application. Applicant respectfully requests consideration of the following remarks.

Detailed Action

The Examiner has objected to claims 1, 5 and 7 for their inclusion of blank lines. The Examiner acknowledges Applicant's statement that the actual ATCC deposit will be delayed until the receipt of notice that the application is otherwise in condition for allowance. As provided in 37 C.F.R. §§ 1.801-1.809, Applicant wishes to reiterate they will refrain from deposit of Hybrid 33A72 until allowable subject matter is indicated. Once such notice is received, an ATCC deposit will be made, and the specification will be amended to contain the accession number of the deposit, the date of the deposit, a description of the deposited biological material sufficient to specifically identify it and to permit examination and the name and address of the depository. The claims (1, 5 and 7) will also be amended to recite the ATCC deposit number. In addition, Applicant submits that at least 2,500 seeds of Variety 33A72 will be deposited with the ATCC. In view of this assurance, the rejection under 35 U.S.C. § 112, first paragraph, should be removed (MPEP § 2411.02). Such action is respectfully requested.

Rejections Under 35 U.S.C. § 112, Second Paragraph

Claims 6, 8, 10-12, 14-16, 18, 19, 21, 23-25, 27-29 and 31-32 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

Claim 6 stands rejected as being indefinite in its recitation of "the ... protoplasts" which lacks antecedent basis in claim 5 on which it depends. Applicant respectfully traverses this rejection. The use of the terminology "protoplasts" is included within claim 5 as stated "tissue culture of regenerable cells". Applicant further submits that a person having skill in the art would associate "protoplasts" with the "tissue culture of regenerable cells". Further, the specification states "the term plant includes plant cells, plant protoplasts, plant cell tissue cultures from which maize plants can be regenerated, plant calli, plant clumps, and plant cells that are intact in plants, or parts of plants, such as embryos, pollen, ovules, flowers, kernels, ears, cobs,

leaves, seeds, husks, stalks, roots, root tips, anthers, silk and the like" (page 38, specification). These are just a few of the examples of tissue cultures that are capable of producing somatic embryogenesis and plant regeneration. In addition, the physiology and morphology of the plant is described in Table 1 in the specification in a manner that one of ordinary skill in the art will clearly understand the plants and their derived tissue culture being claimed by the Applicant. However, in order to expedite prosecution Applicant has now amended claim 6 to read --of the tissue culture-- as suggested by the Examiner, thereby alleviating this rejection. The Examiner is thanked for the suggestion and claim 6 has been so amended.

Claims 8 and 21 are indefinite in their recitation "[t]he maize plant of claim 2 [or 20] wherein said plant is male sterile". Applicant respectfully traverses this rejection. Applicant notes that large scale commercial hybrid maize production requires the use of some form of male sterility system which controls or inactivates the male fertility (page 2, specification). Applicant respectfully submits that the specification supplies an extensive description and definition of "male sterility" in the hybrid 33A72 (pages 2-4, specification). The present invention teaches how a "reliable method of controlling male fertility in plants offers the opportunity for improved plant breeding" (page 2, specification). It is essential to understand that a hybrid maize seed that is produced using cytoplasmic male-sterile (CMS) inbreds are "[p]lants ... are male sterile as a result of factors resulting from the cytoplasmic, as opposed to the nuclear, genome. Thus, this characteristic is inherited exclusively through the female parent in maize plants, since only the female provides cytoplasm to the fertilized seed. CMS plants are then fertilized with pollen from another inbred that is not male-sterile" (page 2, specification). Applicant respectfully submits that claims 8 and 21 clearly define and distinctly claim the subject matter Applicant regards as the invention. However, in order to expedite prosecution Applicant has now amended claims 8 and 21 to read --further comprising a genetic factor conferring male sterility-- as suggested by the Examiner, thereby alleviating this rejection. The Examiner is thanked for the suggestion.

Claims 10, 14, 18, 23, 27 and 31 are indefinite in their recitation of "[t]he maize breeding program of claim 9 [or 13 or 17 or 22 or 26 or 30]". Applicant respectfully traverses this rejection. The claims and their dependents actually refer to previous claims which state "method for developing a maize plant in a maize breeding program". Therefore, Applicant respectfully submits that claims 10, 14, 18, 23, 27 and 31, and their dependents, are not indefinite and are in condition for allowance.

The Examiner states that claims 12, 16, 25 and 29 are indefinite in their recitation of "hybrid maize plant according to claim 2 [or 20] which lacks antecedent basis". Applicant has now amended claims 12, 16, 25 and 29 by deleting "hybrid" as suggested by the Examiner, thereby obviating this rejection.

Claims 11, 15, 19, 24, 28 and 32 are indefinite in their recitation of "high", "below average", "above average", "good" and "suited", as the Examiner states these terms are unduly narrative and imprecise. Applicant traverses this rejection. Each of these claims recites two requirements, first that 33A72 be an ancestor of the plant and second, that the claimed plant be "capable of expressing a combination of at least two 33A72 traits" selected from a Markush grouping. Applicant notes that the Markush listing is directed to "33A72" traits. Thus, Applicant submits that the recitation of 33A72 traits clearly delineates the traits listed as those which are from 33A72 or ancestors thereof. The recitation of "33A72" in front of the term traits clearly indicates that the traits must be originating from 33A72. This is particularly so since the claim also requires that the plant 33A72 must be an ancestor of the claimed plant. Applicant further submits that the adjectives used within the claims are not unduly narrative or imprecise as they do clearly characterize and positively recite the degree of expression of the particular traits within the application in Table 1 (pages 18-20). This terminology is well known in the art and commonly used within breeding techniques of hybrid plants. Applicant respectfully submits that this language is not narrative nor imprecise and would be understood by one in the art and is the terminology of use within the art. Therefore, Applicant respectfully requests reconsideration.

In light of the above remarks, Applicant submits that claims 6, 8, 10-12, 14-16, 18, 19, 21, 23-25, 27-29 and 31-32 clearly define and distinctly claim the subject matter Applicant regards as the invention. Applicant respectfully requests reconsideration and withdrawal of the rejections under 35 U.S.C. § 112, second paragraph.

Issues Under 35 U.S.C. § 102/103

Claims 11, 15, 19, 24, 28 and 32 stand rejected under 35 U.S.C. § 102(e) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Powell (U.S. Patent 6,031,162). The Examiner states the "claims are drawn to a maize plant exhibiting at least two traits which are exhibited by hybrid 33A72 such as high yield and suited to the Western region of the United States".

Applicant respectfully traverses this rejection and requests reconsideration of claims 11, 15, 19, 24, 28 and 32. The Applicant would like to point out that the inventions 33A72 and 90LDI1 are not the same inventions. Nor are their differences minor morphological variations. Applicant submits that the claimed plant cannot be rendered obvious or lacking novelty as it possesses a unique combination of traits which confers a unique combination of genetics.

The inventions 33A72 and 90LDI1 differ for various traits that are not minor. For example, 33A72 has more resistance to stalk lodging when compared with 90LDI1. As reported in Table 2A, 33A72 has a stalk lodging score of 6.1 (page 23). As reported in Table 4 of 6,031,162 Patent, 90LDI1 demonstrates a lower tolerance, with an average score of 5.5. Another example, as reported in Table 4, 33A72 has a growing degree unit of silk emergence of 1390 (page 36). As reported in Table 2 of the 6,031,162 Patent, 90LDI1 demonstrates a higher degree unit of 1546.4. A third example of the differences is that 33A72 exhibits a greater relative maturity than 90LDI1. As reported in Table 4, 33A72 has a comparative relative maturity of 112. As reported in Table 4, 90LDI1 has a relative maturity of 109.

Other traits which differ between the two inventions include: glume color (33A72 purple, 90LDI1 green), width of ear node leaf (33A72 11.0, 90LDI1 9.0), silk color (33A72 pink, 90LDI1 green-yellow), Anthocyanin pigmented brace roots (33A72 moderate, 90LDI1 absent) and resistance to Northern and Southern Leaf Blight (33A72 above average resistance, 90LDI1 no teaching).

The aforementioned examples all illustrate that there are large differences between 33A72 and 90LDI1. The examples listed are not exhaustive but they do give ample evidence that the inventions are not the same. Furthermore, when looking at the tables of both inventions, hybrids created using 33A72 as one of the parents are clearly not anticipated by hybrids made using 90LDI1 as one of the parents.

Applicant further submits that the claims do not simply recite traits, but instead recites these specific traits only to the extent that they are "33A72" traits; thereby coming solely from the seed/germplasm of 33A72. When looking at maize plants it would be possible for one ordinarily skilled in the art to find many traits that are similar between varieties such as the disease resistance or growth habit. Nonetheless, the claim also recites that the claimed plant must have 33A72 as an ancestor further indicating that these traits must originate from the 33A72 plant not 90LDI1. In response to the Examiner's contention that one could not distinguish

the claimed plant from the prior art which shows each of these traits, Applicant submits that one can easily tell by reference to the plants breeding history or its molecular profile whether the plant did indeed have plant 33A72 as an ancestor and expressed two or more "33A72" traits. Further, any phenotypic trait that is expressed is a result of a combination of all of the genetic material present in the plant, and 33A72 will have its own unique genetic background that will give rise to the claimed plant and this profile along with its combination with other plants will result in a unique combined genetic profile that is the product claimed.

Further, there is no expectation of success that the crossing of the Hybrid 90LDI1 with some yet to be identified plant would yield a plant with two of the traits enumerated in the claimed invention because that particular plant did not begin with the claimed seed 33A72 which is essential. Without any teaching about dominance, or heritability of such traits it cannot be said that there is an expectation of success that the combination of plants would achieve the combination enumerated in the claimed invention, to say nothing of issues such as inbreeding depression etc. Applicant asserts that it is not the phenotypic characteristics alone that are claimed and taught in the instant invention. It is a combination of physiological and morphological characteristics, as claimed, which make the present Hybrid non-obvious and not anticipated over Powell. Further, In re Thorpe, states that "a product by process claim may be properly rejected over prior art teaching the same product produced by a different process", as noted by the Examiner. 227 U.S.P.Q. 964, 966 (Fed. Cir. 1985). However, Applicants submit that this is not the same product physiologically or morphologically as the cited prior art as can be evidenced by one skilled in the art through analysis of the data tables in each. In addition, it is impermissible to use hindsight reconstruction and the benefit of Applicant's disclosure to pick among pieces which are present in the art, there must be some suggestion to make the combination and an expectation of success. In re Vaack, 20 U.S.P.Q.2d 1434 (Fed. Cir. 1991). Thus, the present application deserves to be considered new and non-obvious compositions in their own right as products of crossing when 33A72 is used as a starting material.

In light of the above, Applicant respectfully requests the Examiner reconsider and withdraw the rejection to claims 11, 15, 19, 24, 28 and 32 stand rejected under 35 U.S.C. § 102(e) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Powell (U.S. Patent 6,031,162).

Issues Under 35 U.S.C. § 103

Claims 1-32 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Johnson (U.S. Patent 6,046,387). The Examiner states the "claims are drawn to a hybrid maize plant exhibiting all of the characteristics of 33A72".

Applicant respectfully traverses this rejection. When looking at a maize plant it would be possible to find many traits that are similar between varieties such as the color of flowers or growth habit. However, to say there are similarities in phenotype between two varieties is not the same as saying that the two varieties have the same morphological and physiological characteristics as a whole, or that one is an obvious variant of the other. Further, similarity in phenotype does not mean that the two varieties will perform similarly, particularly in a breeding program.

Applicant submits that the Examiner has mistakenly used Johnson as a reference. Further, Applicant submits that Hybrid 17DHD7 does not exhibit the same characteristics as 33A72. Nonetheless, Applicant will illustrate how 33A72 and 17DHD7 are different. Johnson does not teach or suggest hybrid maize plant 33A72 developed by a maize breeding program or the use of hybrid maize plant 33A72 in the production of tissue culture. It must be recognized that the hybrids provided by this invention are themselves unusual and unobvious results of a common process, in that they provide the unique combination of high yield with below average plant height, good brittle snap resistance, good head smut resistance and a relative maturity of 112 (see pages 17-20, specification). Thus, hybrid 33A72 deserves to be considered as a new and non-obvious composition in its own right as does its tissue culture as products of the process when 33A72 is used as starting material. Applicant points out that 33A72 is a unique plant hybrid which never before existed until Applicant filed the application and until its deposit of the same. While Johnson does teach the general regeneration of maize plants from tissue culture techniques, it does not teach or suggest the use of the unique maize hybrid 33A72. As will be demonstrated below, several morphological and physiological characteristics of hybrid 33A72 are either different from or not present in 17DHD7.

For example, hybrid 33A72 has above average resistance to Northern Leaf Blight and Southern Leaf Blight while 17DHD7 does not teach or suggest any disease resistance. The varieties are also different with respect to glume color, Anthocyanin of Brace Roots, length of ear

node leaf, width of ear node leaf, tassel length, fresh husk color and disease resistance.

Differences between the two varieties are summarized in the table below:

<u>CHARACTERISTICS</u>	<u>33A72</u>	<u>17DHD7</u>
Glume color	Purple	Green
Anthocyanin of Brace Roots	Moderate	Absent
Length of ear node leaf (cm)	93.3	90.7
Width of ear node leaf (cm)	11.9	9.4
Tassel length (cm)	62.9	41.7
Fresh husk color	Dark-green	Green
Disease Resistance	Resistance to Common Rust, Gray Leaf Spot, Diplodia Ear Rot, European Corn Borer (1 st generation)	None taught

This comparison clearly shows that 17DHD7 does not exhibit the characteristics of hybrid 33A72. Further, the present application clearly shows in Table 1 at p. 18-20 and Tables 2-4 that hybrid 33A72 exhibits a relative maturity of 112, high yield, with below average plant height, good brittle snap, good head smut resistance and the aforementioned characteristics. This unique and unobvious combination of traits makes hybrid 33A72 particularly well suited to the Western region of the United States.

In light of the above, Applicant respectfully requests the Examiner reconsider and withdraw the rejection to claims 1-32 under 35 U.S.C. § 103(a).

Conclusion

In conclusion, Applicant submits in light of the above amendments and remarks, the claims as amended are in a condition for allowance, and reconsideration is respectfully requested.

No additional fees or extensions of time are believed to be due in connection with this amendment; however, consider this a request for any extension inadvertently omitted, and charge any additional fees to Deposit Account No. 26-0084.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "Version with markings to show changes made."

Reconsideration and allowance is respectfully requested.

Respectfully submitted,



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Application No. 09/760,334

**AMENDMENT — VERSION WITH MARKINGS
TO SHOW CHANGES MADE**

In the Specification

Please replace the paragraph at page 38, beginning at line 32 with the following:

With the advent of molecular biological techniques that have allowed the isolation and characterization of genes that encode specific protein products, scientists in the field of plant biology developed a strong interest in engineering the genome of plants to contain and express foreign genes, or additional, or [modified]modified versions of native or endogenous genes (perhaps driven by different promoters) in order to alter the traits of a plant in a specific manner. Such foreign, additional and/or modified genes are referred to herein collectively as "transgenes". Over the last fifteen to twenty years several methods for producing transgenic plants have been developed, and the present invention, in particular embodiments, also relates to transgenic versions of the claimed hybrid maize line 33A72.

In the Claims

Claims 5, 6, 8, 12, 16, 21, 25 and 29 have been amended as follows:

5. (Amended)

A tissue culture of regenerable cells of a hybrid maize plant 33A72, representative seed of said hybrid maize plant 33A72 having been deposited under ATCC accession number _____, wherein the tissue culture regenerates plants capable of expressing all the morphological and physiological characteristics of said hybrid maize plant 33A72.

6. (Amended)

A tissue culture according to claim 5, [the] cells or protoplasts of the tissue culture being from a tissue selected from the group consisting of leaves, pollen, embryos, roots, root tips, anthers, silks, flowers, kernels, ears, cobs, husks, and stalks.

8. (Amended)

The maize plant of claim 2 [wherein said maize plant is male sterile] ,further comprising
a genetic factor conferring male sterility.

12. (Amended)

A [hybrid] maize plant according to claim 2, wherein the genetic material of said plant
[contains]further comprises one or more transgenes.

16. (Amended)

A [hybrid] maize plant according to claim 2, wherein the genetic material of said plant
[contains]further comprises one or more genes transferred by backcrossing.

21. (Amended)

The maize plant of claim 20 [wherein said maize plant is male sterile] ,further
comprising a genetic factor conferring male sterility.

25. (Amended)

A [hybrid] maize plant according to claim 20, wherein the genetic material of said plant
[contains]further comprises one or more transgenes.

29. (Amended)

A [hybrid] maize plant according to claim 20, wherein the genetic material of said plant
[contains]further comprises one or more genes transferred by backcrossing.